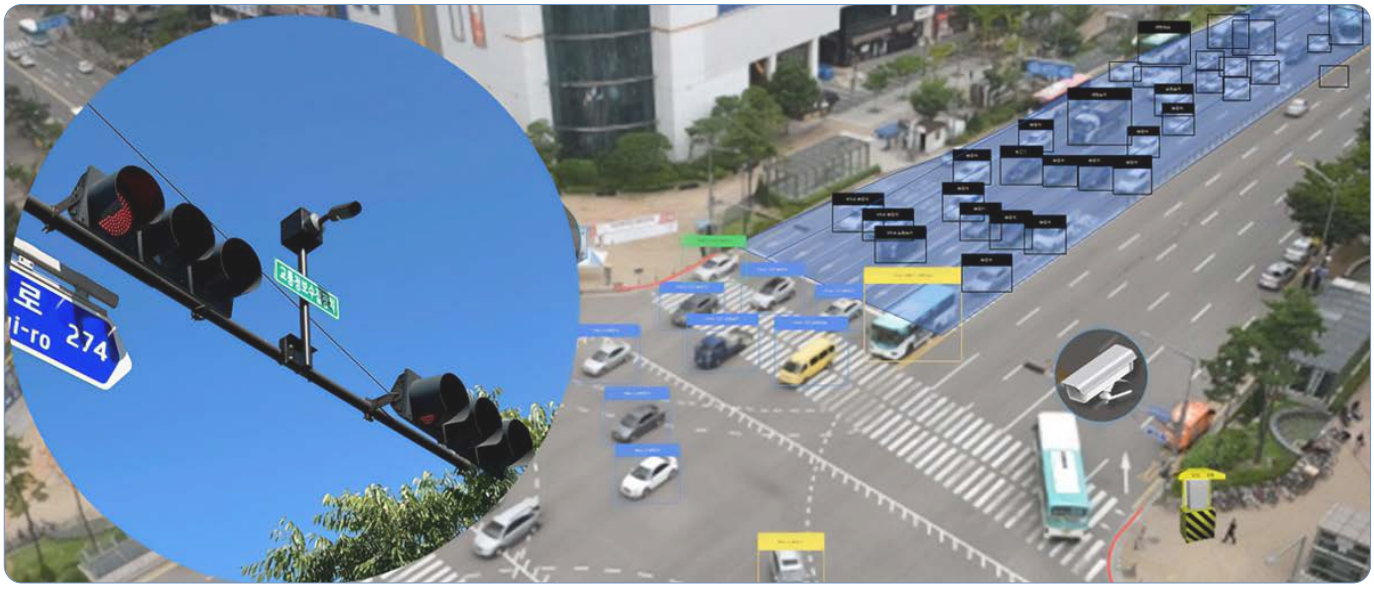
Intelligent Intersection Management System

The Intelligent Intersection Management System is an intelligent traffic control technology that flexibly adjusts signal cycles according to traffic conditions.

The Intelligent Intersection Management System automatically detects changing traffic volumes by time of day, evaluates congestion levels, and operates optimized intersection signals to enable smooth traffic flow.



▲ The Intelligent Intersection Management System identifies vehicles using the intersection and analyzes traffic volume.

Issues to Tackle

- Instead of setting a uniform signal cycle, it is necessary to assign customized traffic signals.
- It is necessary to optimize signals in areas with chronic traffic congestion to prevent traffic violations.

Expected Benefits

- Improved intersection utilization efficiency by reducing signal waiting time per vehicle and increasing the number of vehicles passing through per signal cycle.
  * Average delay time decreased by 41%, and signal violations decreased by 36%.
- Using the collected data, various traffic operation indicators are calculated and used for policy, while intersection operation is improved through regular monitoring.

Key Services

· Optimizing traffic signals by detecting vehicles based on intersection direction and lane, as well as calculating traffic volume and queue length.,

  * Connected to the incident detection system, various unexpected situations at intersections are identified, enabling real-time response to changes in traffic conditions.

· The signal is automatically changed to allow emergency vehicles, such as fire trucks, to pass through the intersection with priority in connection with the emergency vehicle priority signal system.

Use Cases

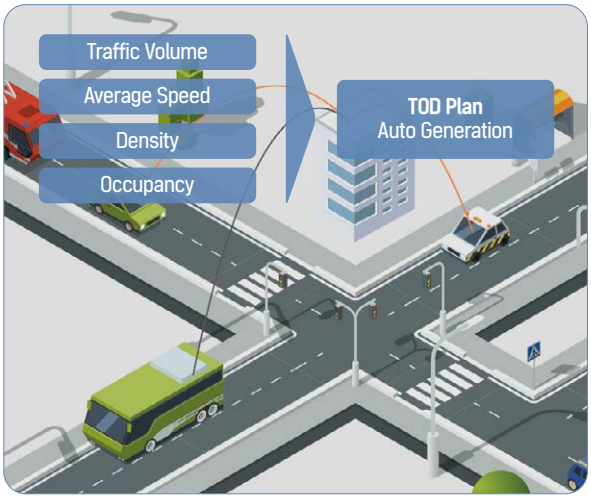
· In June 2023, Seoul City implemented the Intelligent Intersection Management System (IIMS), which incorporates advanced technologies such as AI CCTV and LiDAR, at intersections like Taereung Station and Hwarangdae Station to operate signals flexibly according to traffic conditions.

· In 2024, Suwon City began its Intelligent Traffic System (ITS) construction project, which includes the development of an 'IIMS', utilizing AI video analysis technology.

· Easy Traffic has implemented a real-time signal control system based on the 'IIMS' overseas, including at intersections in Manila, Philippines, in 2019; Baku, Azerbaijan, in 2021; and Asunción, Paraguay, in 2024.

Key Components

Configuration



Technology

1. Detection and tracking of vehicles by intersection entry lane
- Detection and tracking of all objects larger than 12x12, including vehicles going straight, turning right, turning left, and making U-turns, within the detection area, assigning a unique ID to each object.

2. Vehicle classification
- Small (sedan, SUV, van, trucks under 2.5 tons), large (trucks over 2.5 tons), bus classification.

3. Pedestrian detection
- Detection and tracking of pedestrians using roads and crosswalks, pedestrian counting.

4. Occupancy and queue length calculation
- Calculating accumulated lane occupancy rate by lane for each 5 minutes, and estimating queue length based on the number of waiting vehicles within the detection area for each lane.

5. Real-time traffic volume calculation
- Record raw data (pedestrians, traffic volume) every 5 minutes, and store and calculate traffic volume by time (signal) in conjunction with a signal detection device.

(Application Service) Emergency Vehicle Priority Signal System

1. Emergency Vehicle Driver App
- A dedicated app that provides quick and convenient directions to the destination by providing navigation, traffic signal information, location and destination information, etc. on the smartphone or tablet installed in the vehicle for emergency vehicle drivers.

2. Vehicle Location Tracking
- Tracking of the vehicle's current location, destination, and route information through a dedicated app installed on the smartphone or tablet installed in an emergency vehicle.

3. Intersection Arrival Time Prediction Technology
- Applying an algorithm to predict the arrival time for all intersections on the route based on the vehicle's current speed and location information.

4. Remote Signal Control
- A technology that changes the traffic light to green in the direction of travel when an emergency vehicle arrives and returns it to normal mode after the vehicle has passed.

5. Signal Compensation Return
- A technology that compensates for delays in other directions by providing additional green time in a specific direction to support emergency vehicles.

6. Wide Area Information Linkage
- A technology that supports controlling metropolitan emergency vehicle priority signals through information linkage with neighboring local governments.

Technology Companies

DAREESOFT
www.dareesoft.com

THE-ROAD INC
www.the-road.co.kr

LAON ROAD
www.laonroad.com

REXGEN
www.rexgen.co.kr

EASY TRAFFIC
www.easytraffic.co.kr

PINTEL
www.pintel.co.kr